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Living leaves and stems of *Corydalis Brandegei.* Colorado. *T. S. Brandegee.*

PUCCINIA BOISDUVALLIÆ.—Spots indefinite, yellowish, often tinged with red or brown; sori few, scattered, amphigenous, brown; spores obovate or oblong-elliptical, obtuse, slightly constricted at at the septum, smooth, .0014–.0016 of an inch long, .0008–.00095 broad; pedicels short, colorless.

Living leaves of *Boisduvalia Torreyi.* Santa Cruz, California. *M. E. Jones.*

UROMYCES JONESII.—Spots none; sori amphigenous, small, scattered, reddish-brown; spores subglobose to elliptical, verruculose, .0011–.0014 of an inch long, .0009–.0011 broad; pedicel short, colorless.

Living leaves of Ranunculus. Soda Springs, California. *M. E. Jones.*

The roughly warted spores and scattered amphigenous sori are notable features in this species.

TRICHOBASIS WYETHIÆ—Spots none; sori dot-like, abundant, often occupying the whole lower surface of the leaf, reddish-brown; spores subglobose or broadly elliptical, .0012–.0016 of an inch long, .0008–.0012 broad.

Living leaves of *Wyethia angustifolia.* Colorado. *T. S. Brandegee.*

TRICHOBASIS HELIANTHELLÆ.—Spots pale greenish; sori hypophyllous, numerous, generally most abundant along the midrib, reddish-brown; spores globose or subglobose, uninucleate, .0012–.0014 of an inch in diameter.

Living leaves of *Helianthella Californica.* Soda Springs, California. *M. E. Jones.*

Plucheas.—*Pluchea camphorata*, *P. fœtida*, and even *P. purpurascens,* DC., appear to be forms of one variable and widely diffused species. Is the plant of the Mississippi valley found growing anywhere far from subsaline soil, and is the root perennial? Is the root of *P. camphorata* ever perennial?—A. GRAY.

On the Power possessed by Leaves of placing themselves at Right-Angles to the direction of Incident Light: by Francis Darwin. Journal of the Linn. Soc., no. 112 (vol. xviii, pp. 420–455), published June, 1881, read Dec. 16, 1880.—Taking up this subject where it was left by his father and himself in the work on "The Power of Movement in Plants," Mr. Francis Darwin, in this paper, records his investigations and experiments made with a well-devised modification of Sachs' Klinostat, with the view of determining whether Frank's or DeVries's explanation of the position which leaves normally assume with respect to the light is the more tenable. While the vertical position assumed by the growing plant's axis is attributed to geotropism and heliotropism, Frank attributes the position taken by leaves (with one face to the sky and the other to the ground) to transverse geotropism and transverse heliotropism. "An organ which grows transverse-geotropically, places itself horizontally. .... In the same way a transversly heliotropic organ has an inherent tendency to place itself at right-angles to, instead of parallel [as does the stem] to the direction of incident light. It may be said that this is no explanation at all; and this is true in a certain sense. But there is no reason why it should be more unsatisfactory than the accepted explanation of the vertical growth of stems and roots, namely, that they have an inherent power of growing in these directions." Indeed the one is just as satisfactory or unsatisfactory as the other. The terms "geotropism," " heliotropism," "apheliotropism" and the like, transverse or otherwise,—now a numerous brood,—are useful and not misleading, when held to mean only that, in fact, a leaf "has an inherent tendency to be horizontal," or "to place itself at right-angles to the direction of incident light" and "the hypocotyl of a seedling has an inherent tendency to grow vertically upwards. "The technical terms are unsatisfactory only when they are supposed to carry more explanation than the simple and untechnical statement does. But do leaves take their position in virtue of an inherent tendency? This is substantially denied by DeVries,or at least he maintains that the assumption is needless, for that it may be the result of an antagonism between positive and negative heliotropic and geotropic forces, or between these and what he calls *epinasty* and *hyponasty*. These new technical terms are simple in meaning. An organ, such as a leaf, is epinastic when the upper half grows in length more than the lower, and the effect is convexity above and concavity below, or downward curvature: it is hyponastic when the reverse takes place. And the suggestion is, that the horizontal position of a leaf under zenith illumination may be due simply to an equilibrium between two or more of these opposing forces. It is unnecessary to enter into particulars of how this obviously might produce the effect: for the result of Mr. Francis Darwin's experiments is a clear disproof of DeVries' suggestion. In the "fundamental experiment:. . if a plant whose leaves have the power of placing themselves at right-angles to incident light is growing normally in the open air and lighted from above, its leaves will be horizontal. Let the plant be now made to rotate on a klinostat [so slowly that no centrifugal effect will be produced, but rapidly enough to destroy all geotropic action] so that the axis of rotation coincides with the axis of the plant. And let the direction of the incident rays of light be parallel to the axis of rotation, so that the morphologically upper side of the leaves is illuminated by rays striking them at right-angles, just as they were when the plant grew on the ground. Then, if the normal horizontal position is the result of a balance between geotropism (positive or negative) and any other force—epinasty, hyponasty, positive or negative heliotropism,—it is clear that, geotropism being destroyed by the rotation, the balance cannot be maintained." The experiments, varied in many ways, and with arrangements to eliminate epinastic and hyponastic tendencies, plainly bring out the conclusion "that the power which leaves have of placing themselves at right-angles to the incident light is due to a specialized sensitiveness to light, which is able to regulate or govern the action of other external forces, such as gravitation, or of internal forces, such as epinasty."—A. G. *in Am. Jour. Sci.*

Ranunculus.—I invite attention, this season, to the various forms which in this country pass under the name of *Ranunculus repens*, L. I suspect that the European species, one which merits the specific name, is not indigenous to the United States, but is occasionally met with as a naturalized plant. The "third form" with "spotted leaves," mentioned in Mr. Ward's new Flora of Washington, would seem to be of this species. Does the low and early-flowering form of our common species make runners later in the season? And do the larger forms of low ground freely produce prostrate shoots and do these take roots?"—A. GRAY.

Botanizing on Comanche's Peak, Texas.—This high bluff is one of the most remarkable features of Central Texas. Situated six miles south of Granbury, it towers above the beautiful valley of the Brazos like an immense citadel, its height above the valley being estimated at six hundred feet. It is seen from long distances in every direction and from its top a most extensive view is obtained. Like an isolated sentinel, it seems to be the only remnant of a vast plateau that has been washed away. Belonging to the Cretaceous Period, its rocks full of interesting marine fossils have characterized one group of that period, bearing the name of *Comanche's Peak Group*.

In September, 1881, my wife and I visited the peak on a botanizing expedition, but the season was not favorable except for a few grasses which I will mention below. The *Euphorbia Fendleri* and *Paronychia Jamesii* were the only interesting plants in bloom. On the rocks which had fallen from the top of the peak we noticed some *Solidago nemoralis* in bud, but most of the species were detected by means of leaves, or dried stems bearing seeds; such as *Arenaria Michauxii*, *Erythræa Texensis*, *E. Beyrichii*, and *Sabbatia campestris*. We looked eagerly for ferns, but only two were obtained, *Pellæa atropurpurea* and *Notholæna dealbata*, of the latter only a small specimen. The pretty *Cereus pectinatus* is also growing there, being, I think, one of its more northeastern stations.

The grasses were; 1, a *Bouteloua* much resembling *oligostachya* but with culms 2 or 3 feet high and that in poor rocky soil; 2, *Leptostachya dubia*; 3, *Tricuspis* (probably *mutica* of Torrey); 4,